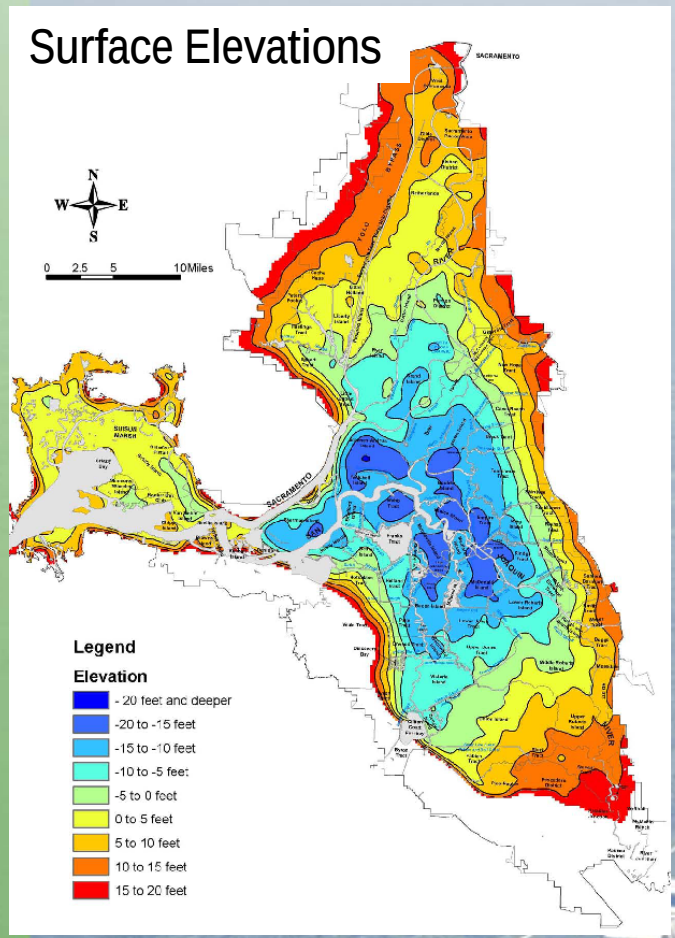
Delta Risk Management Strategy



Presentation by:
Les Harder
Deputy Director
Department of Water Resources

URS/JBA

Delta Risk Management Strategy

- **Evaluate current and future risk**
- **Identify consequences**
- **Identify risk reduction measures, including levee upgrades and land use changes**
- **Evaluate alternative strategies to reduce risk**

Phase 1: Evaluation of Risks

Phase 2: Evaluation of Alternative Strategies to Reduce Risk

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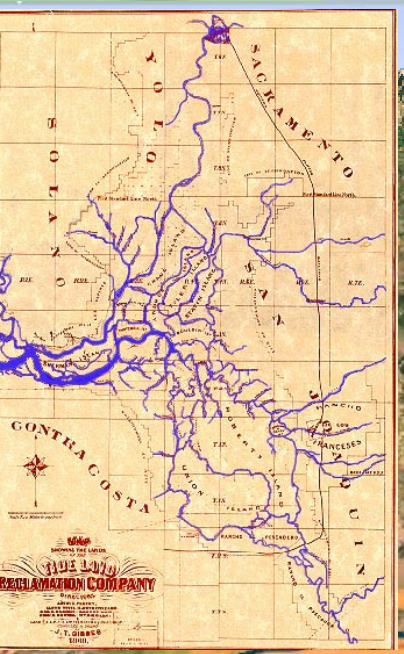
Sacramento-San Joaquin Delta



Design and Construction History

Delta Risk Management Strategy

Phase 1 Risk Evaluation

- **Development of a Risk Analysis to Evaluate the Impact to Delta Levees from:**
  - **Floods**
  - **Earthquakes**
  - **Unexpected Failures**
  - **Subsidence**
  - **Climate Change**
- **Determine Consequences to Economy & Eco-System based on Risks Found**

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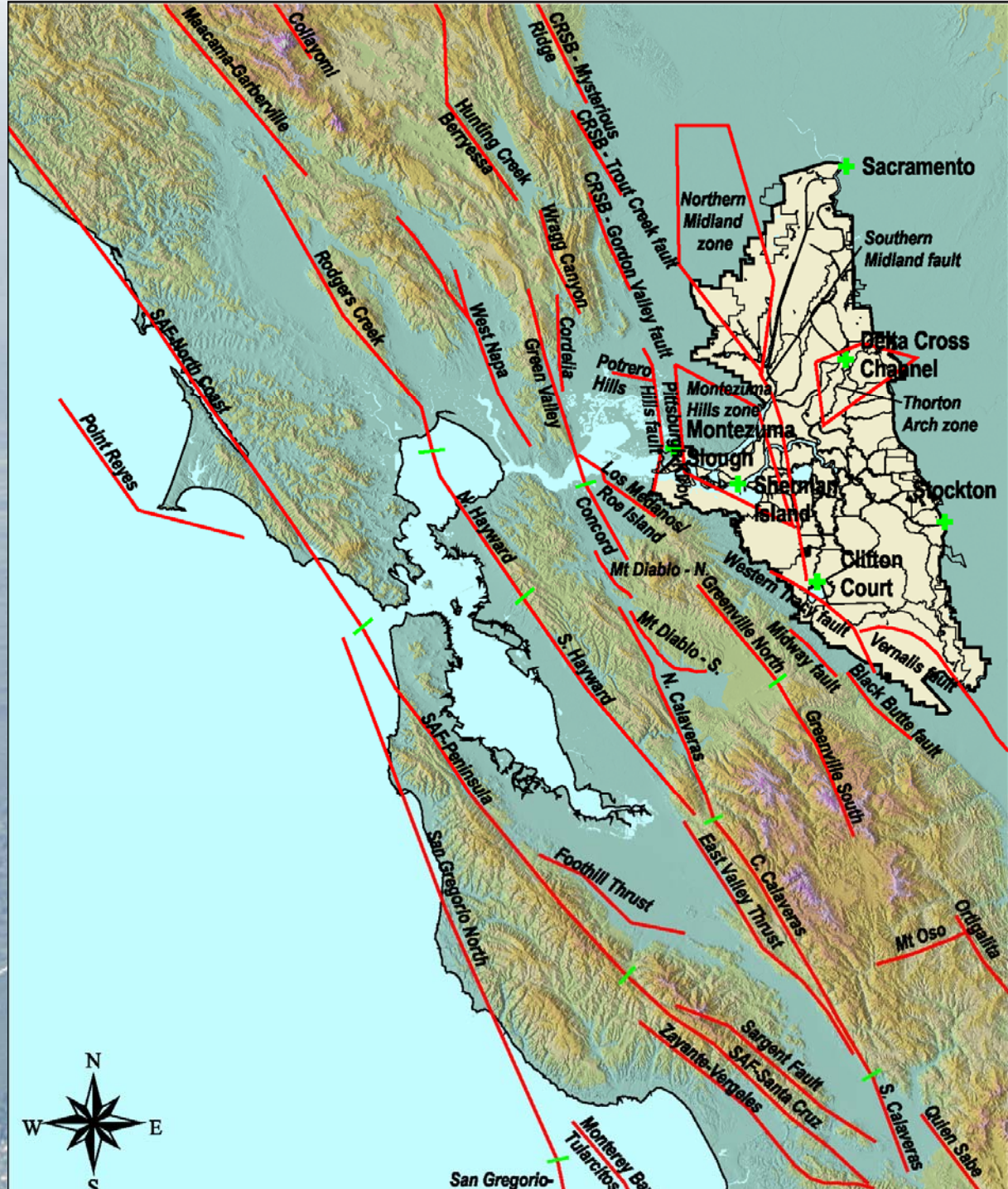
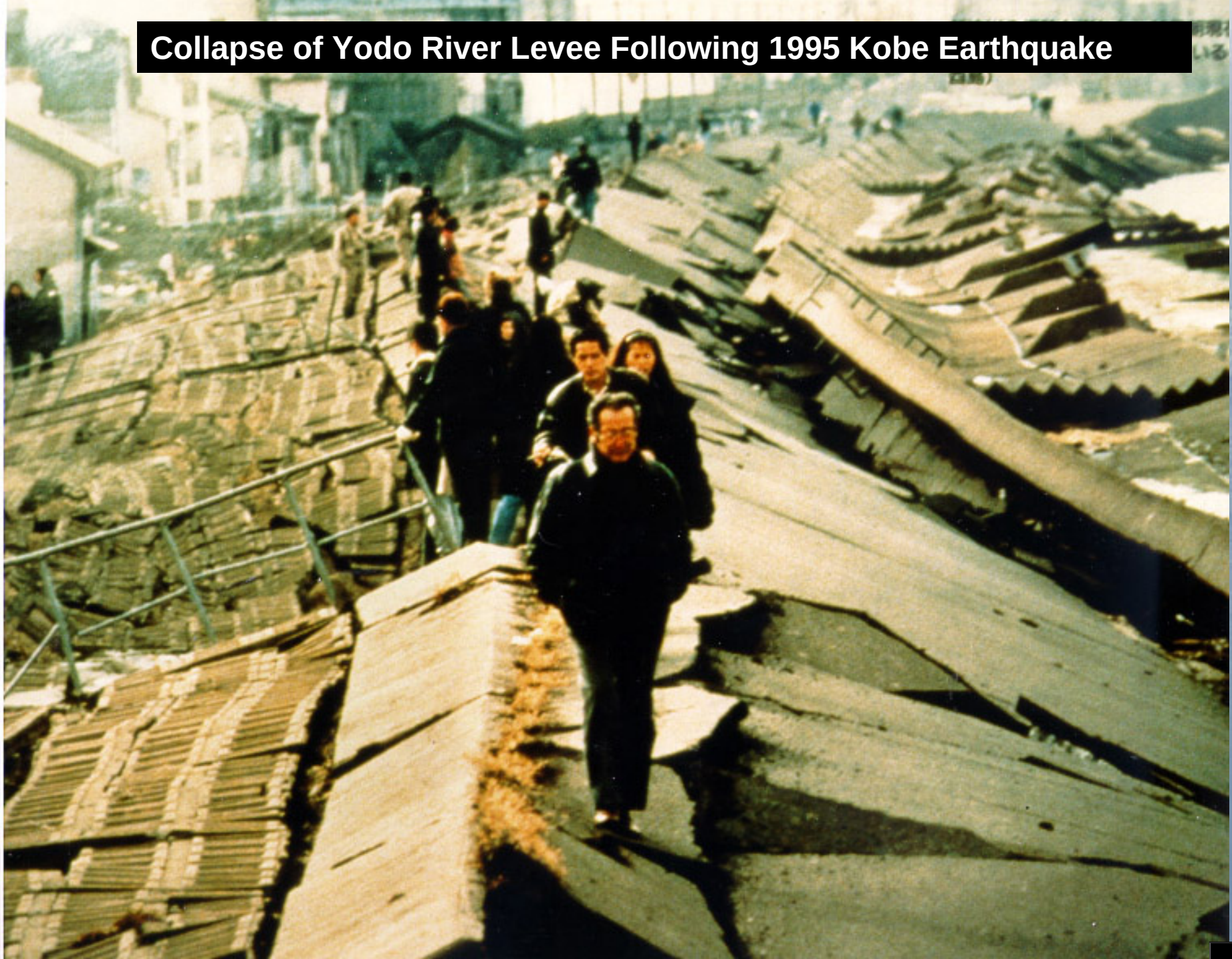
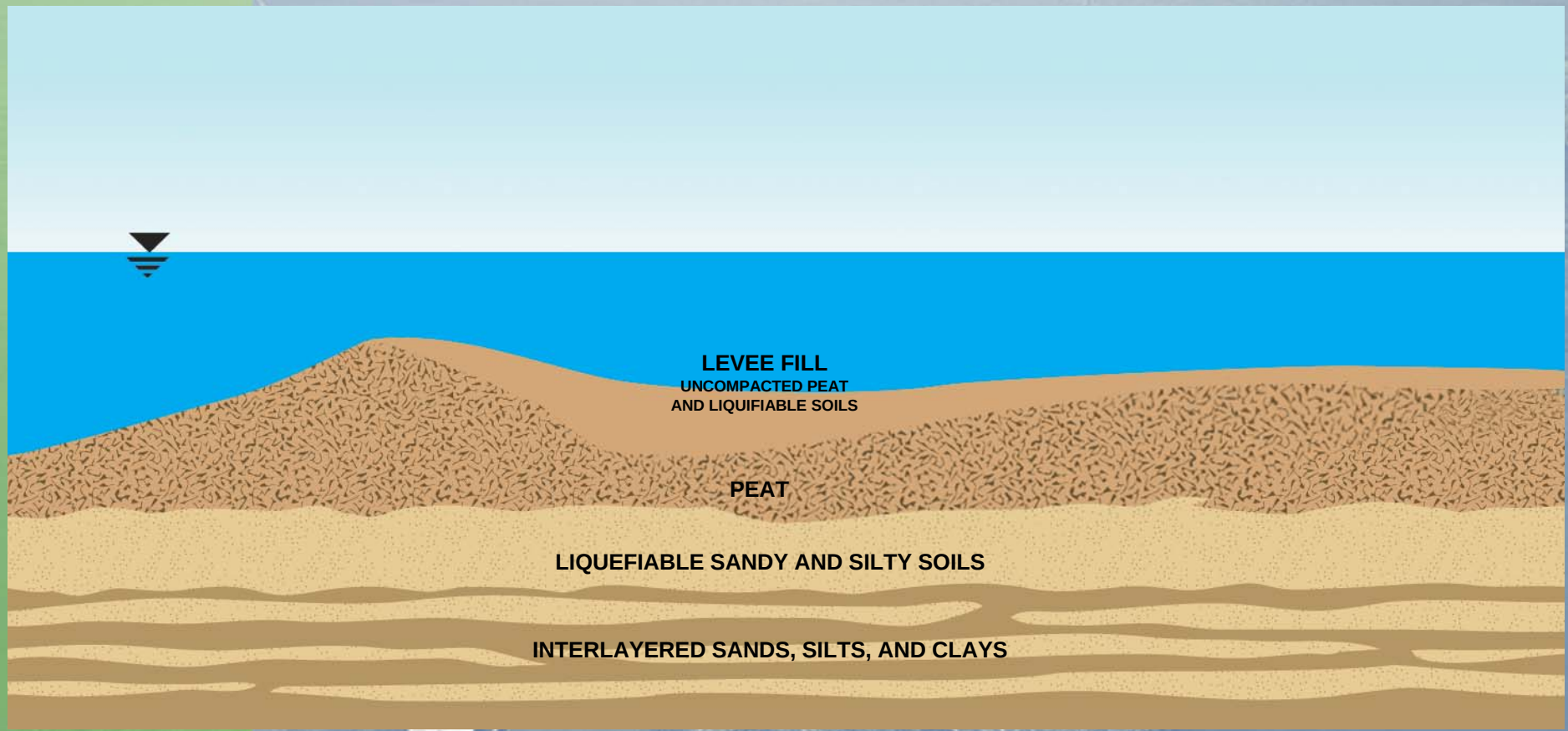
Bay Area Fault Map



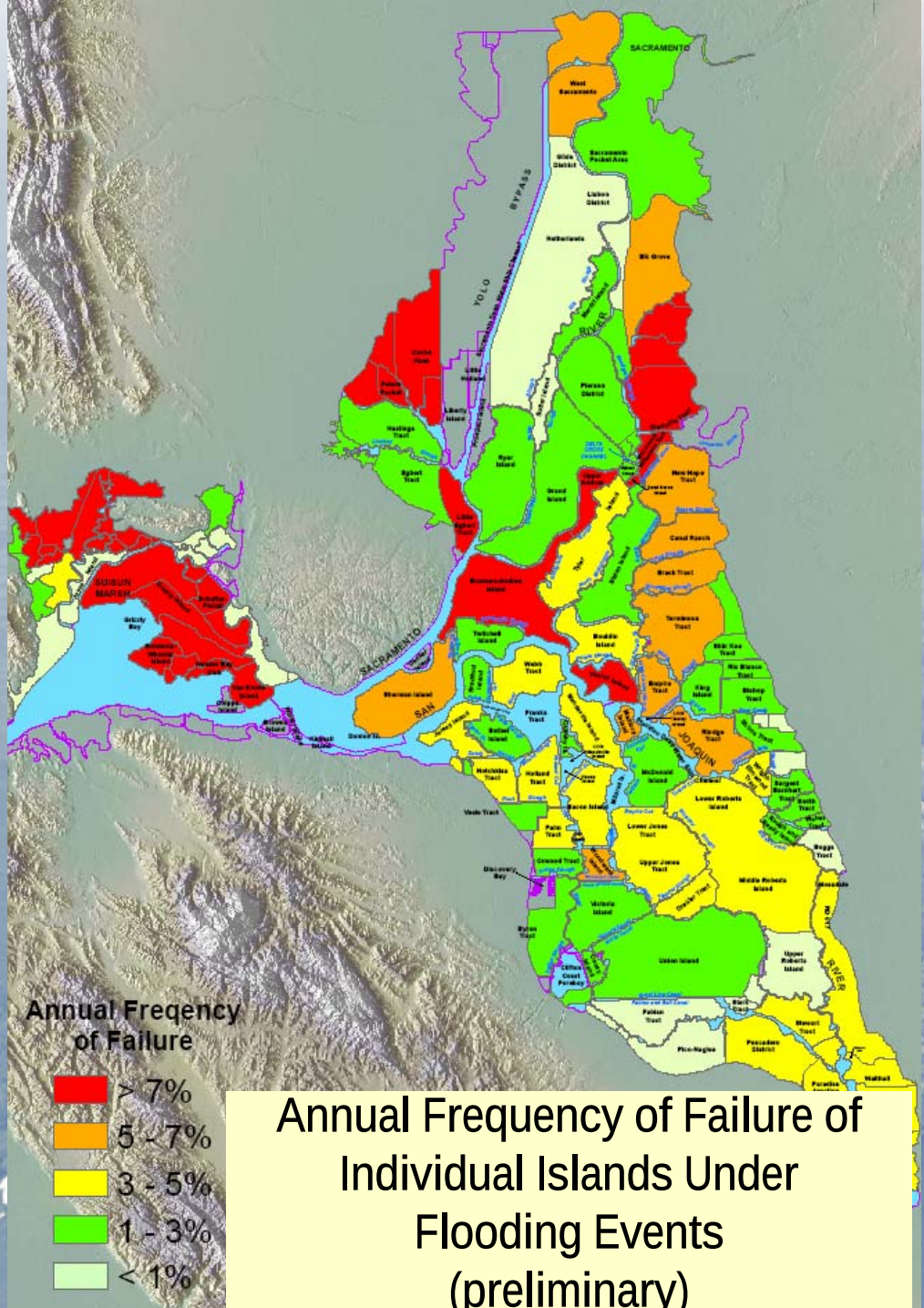
Moderate Damage to Yodo River Levee Following 1995 Kobe Earthquake


Collapse of Yodo River Levee Following 1995 Kobe Earthquake

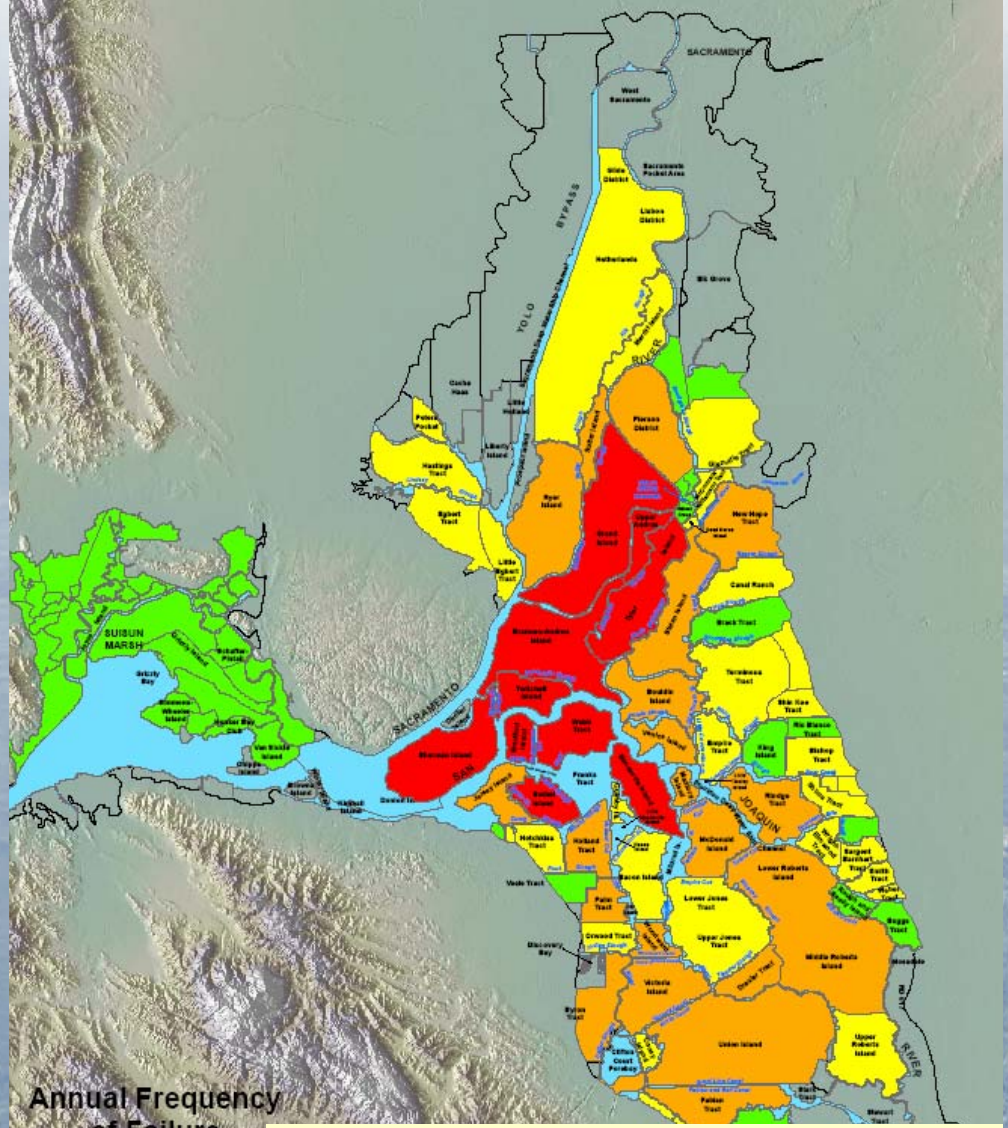

LEVEE FILL
UNCOMPACTED PEAT
AND LIQUIFIABLE SOILS
PEAT
LIQUEFIABLE SANDY AND SILTY SOILS
INTERLAYERED SANDS, SILTS, AND CLAYS

Floodwaters enters island

Collapse of Moss Landing Marsh Levee Following 1989 Loma Prieta Earthquake



Annual Frequency of Failure of Individual Islands Under Flooding Events (preliminary)



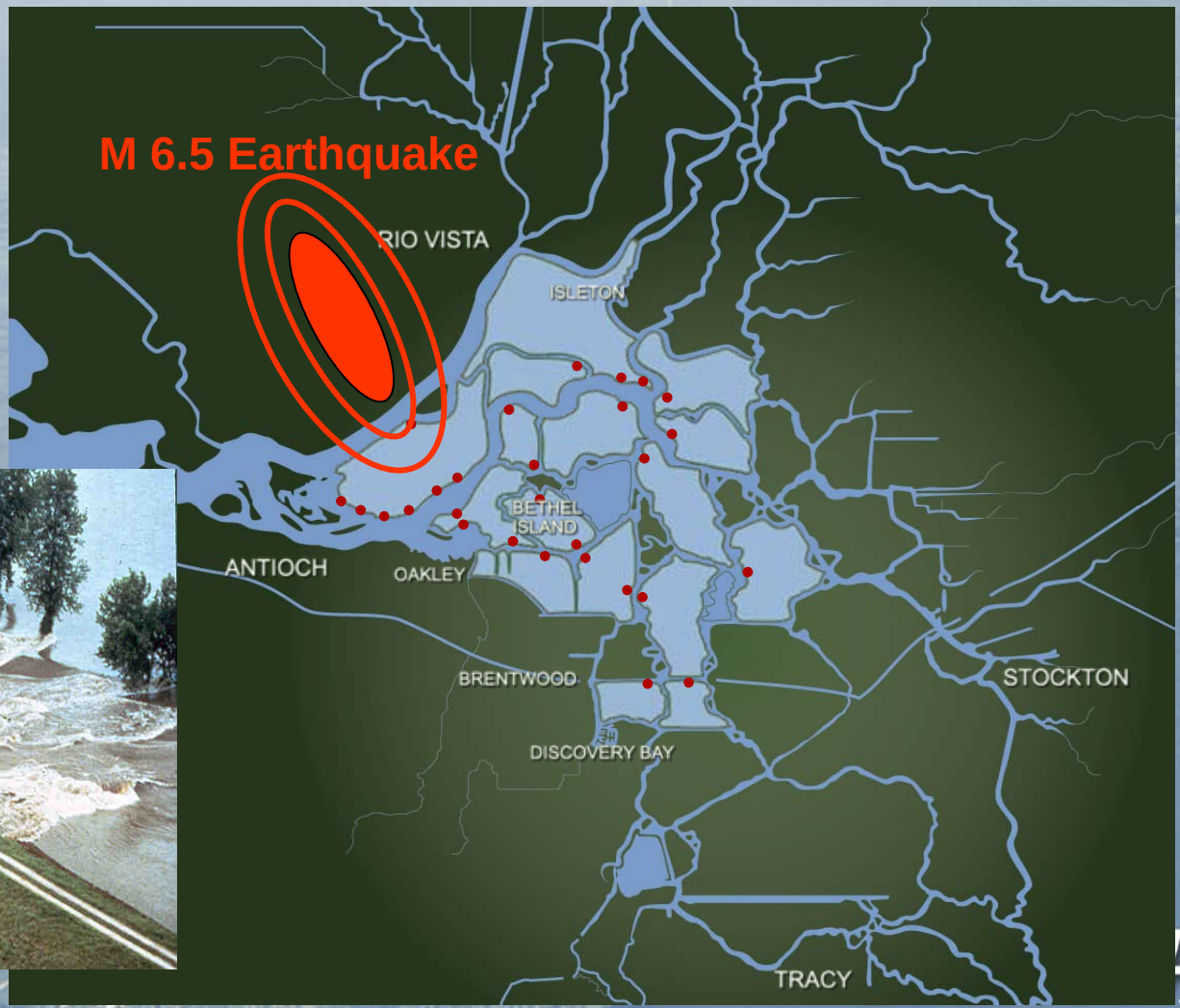
Annual Frequency of Failure of Individual Islands Under Seismic Events

(preliminary)

Summary of Key Findings
(preliminary)

- 160-260 flood-related island failures expected in the next 100 years
- 12-15 simultaneous island failures in a major flood event
- 28% chance of 30+ islands failing simultaneously in a major earthquake in the next 25 years

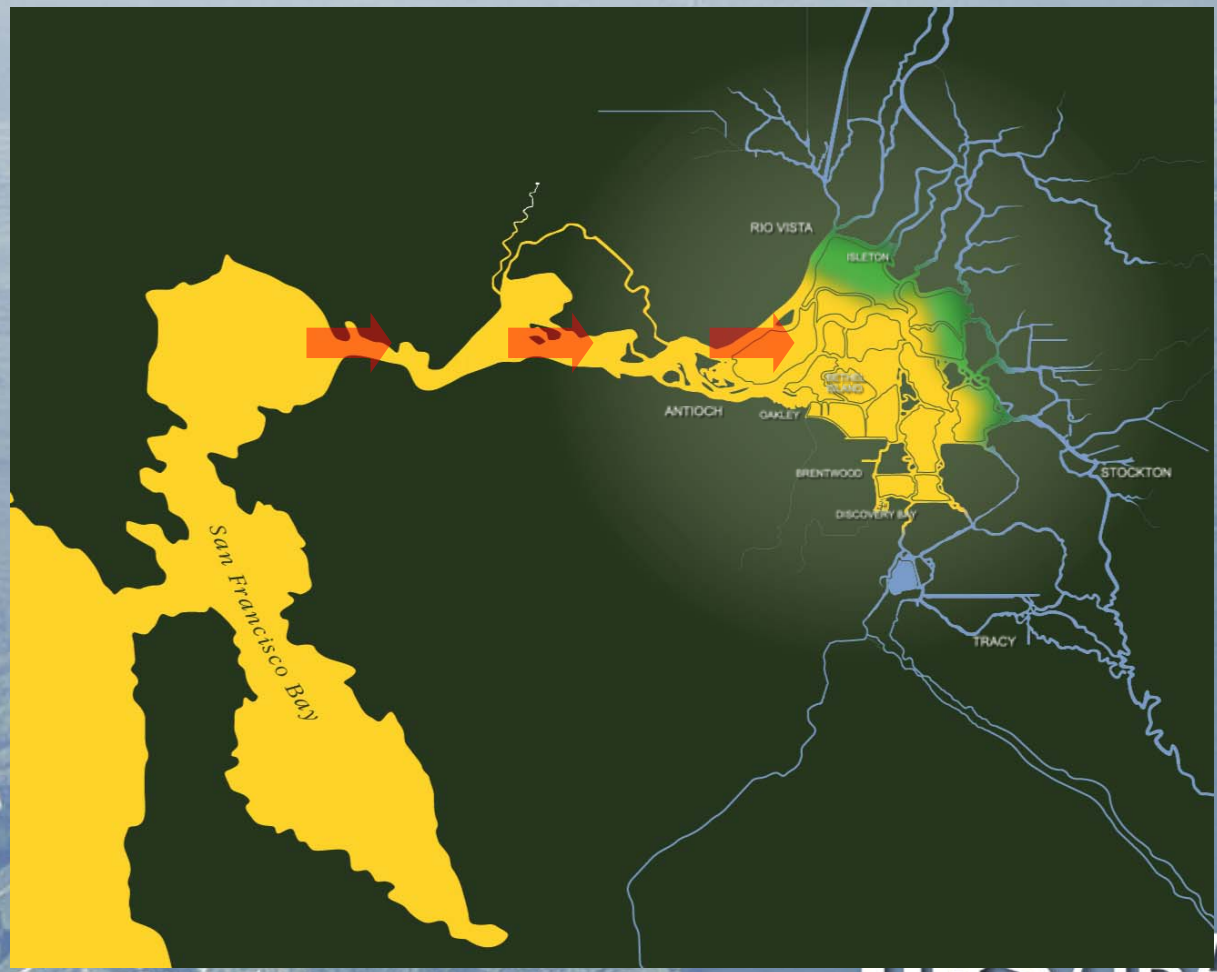
Magnitude 6.5 Earthquake Scenario



Magnitude 6.5 Earthquake Scenario

When the Delta Levees Fail

- 300 billion gallons of salt water flow into the Delta in first few days



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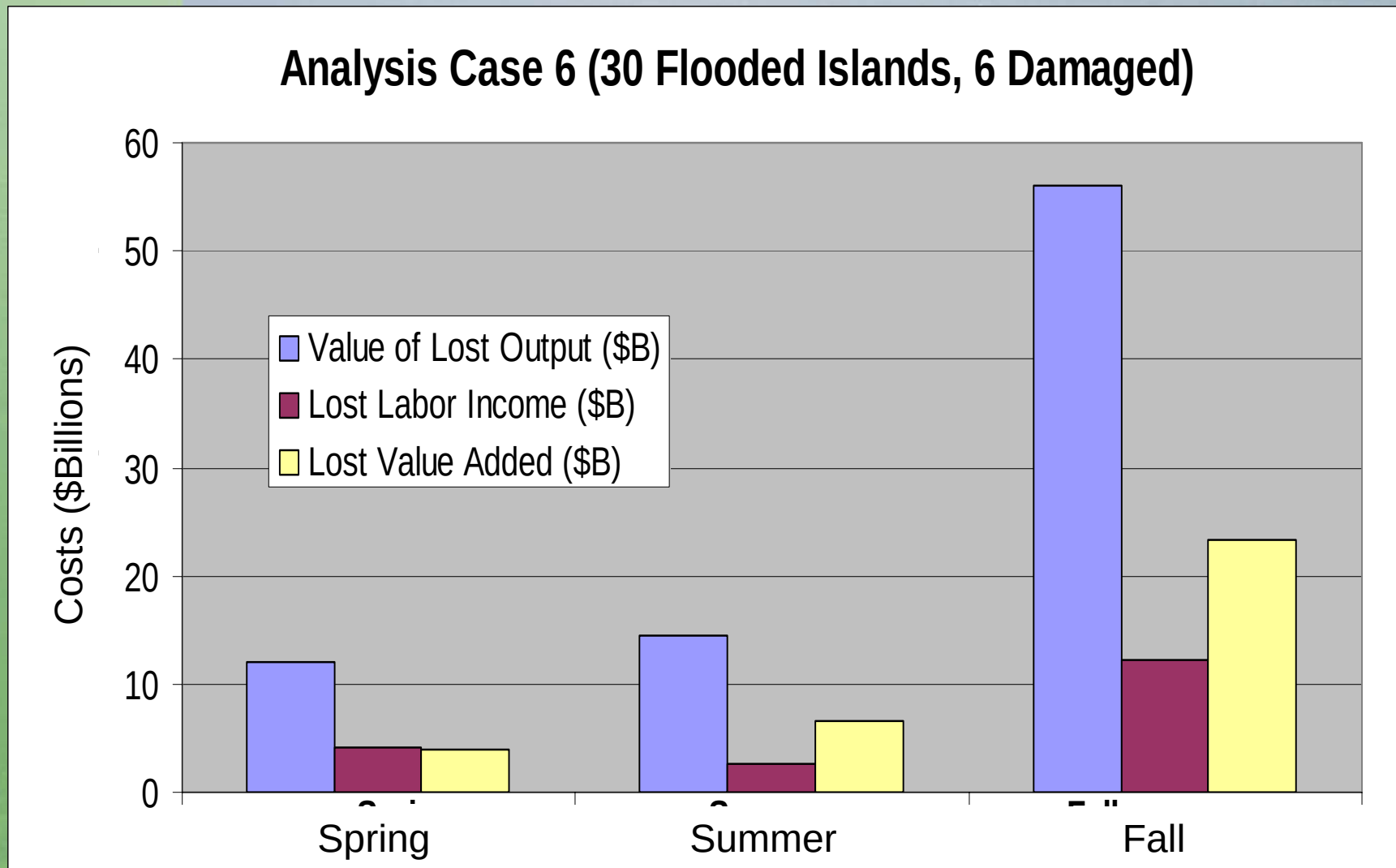
Indirect Economic Costs Seismic Failures

(preliminary)



Summary of Key Findings

(preliminary)

- Probability of flood-related levee failure
  - increases by 10% in 2050
  - Increases by 24% in 2100
- Probability of seismic-related levee failure
  - increases by 12% in 2050
  - increases by 27% in 2100
- 3 feet of sea level rise would push the salt line about 3 miles to the east

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Delta Risk Management Strategy

Phase 2: Development and Evaluation of Risk Reduction Strategies

- **Develop a menu of risk reduction measures that could reduce risk – *"building blocks"***
- **Package the measures into different combinations -> *"trial scenarios"***
- **Use Risk Model to evaluate potential risk reductions**
- **Evaluate benefits and costs of risk reduction measures**

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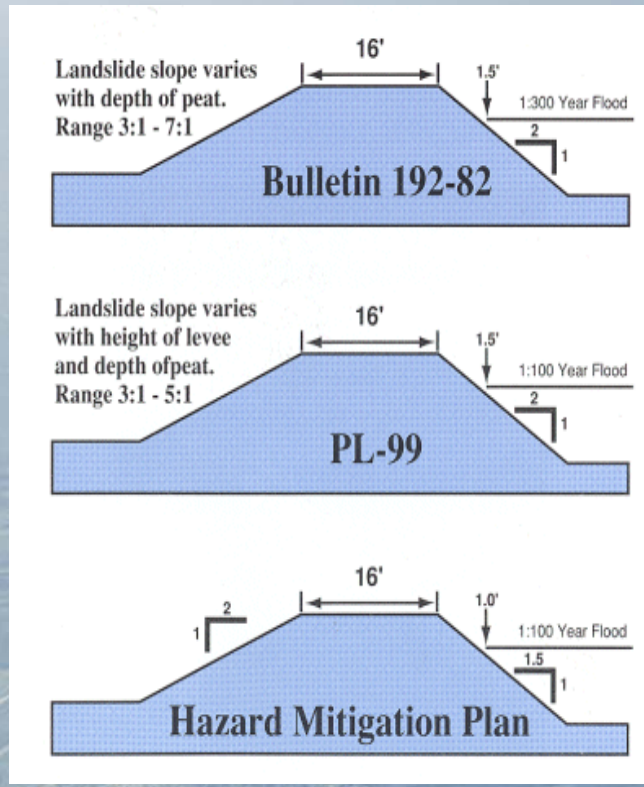
Delta Risk Management Strategy

Potential Risk Reduction Building Blocks:

- Improved Levee Maintenance
- Upgraded Delta Levees
- Enhanced Emergency Preparedness/Response
- Pre-Flooding of Selected Western Islands
- Land Use Changes to Reduce Subsidence
- Armored Through Delta “Pathway” Conveyance
- Isolated Conveyance
- Elevation of State Highways on Piers
- Armored Infrastructure Corridor
- Suisun Marsh Restoration
- Cache Slough Restoration
- Fish Screens
- Reduced Water Exports



DRMS Phase II
Trial Scenarios Being Proposed

- Improved Levees
- Armored Pathway
- Isolated Conveyance

Delta Risk Management Strategy

Tentative Project Schedule

2007 | 2008

April | May | June | July | August | September | October | November | December | January

DRMS PHASE I Report

- Admin. Draft 4/23
- St. Comm. Submits Comments 5/25
- Final Draft 6/15
- Final Report 8/15

IRP Review 6/15 – 7/27

DRMS PHASE II Report

- St. Comm. Recommends Scenarios 6/5
- Admin. Draft 8/3
- St. Comm. Submits Comments 9/4
- Final Draft 10/1
- Final Report 11/20

IRP Review 10/1 – 10/31

DELTA VISION PROCESS

- DV Meeting 4/27
- DV Meeting 5/31
- Delta Vision Submits Vision of Sustaninable Delta to Legislature 1/01/08


Thank You